Applied Systems and Synthetic Biology in Micro-Fluidic Biochips

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The design of bio-molecular systems within cells, it is a recently achievement of synthetic biology and systems biotechnology [1]. Due to the structurity laws [2] of the synthetic biosystems theory: 1).structure integration, coordinative organization of genes network in genome; 2).function adaptation, duplication (amplify) and specific expression of genome involved in cell signalling; 3).construct stratification, multiple stratum of genome constructed by transpose, recombination and amplification. We developed the techniques of the Sequence Tagged Fragments Display (STFD) for analysis of genes differential expression between cell types, and the design of cell signal transduction and gene regulatory network within cell according to cell phenotypes and genes differential expression during cell proliferation, differentiation, apoptosis and situation of drug treatments etc. By applied the methods of systems genetics [3] and synthetic biology for biosystems analytics and artificial biosystems, it is very benefit for the technology integration of micro-fluidic biochips used for drug discovery, isolation of non-known sequence gene, transgenesis and design of cellular nano-factory and nano-computer of bio-molecules systems.
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